



via electronic transfer and first class mail

February 6, 2012

Michelle Kerr
Remedial Project Manager
U.S EPA – Region 5
77 W. Jackson Blvd.
Mail Code: S-6J
Chicago, IL 60604-3590

**Re: Technical Impracticability Determination Scope of Work
United States of America v. AK Steel Corporation et. al.
Case No. 1:10-cv-00996-KMO
Chemical Recovery Systems Superfund Site, Elyria, Ohio**

Dear Ms. Kerr:

As discussed during the meeting between the CRS Site RD/RA Group (“the Group”) and USEPA dated 14th of November 2011 for the CRS Site in Elyria Ohio (the “Site”), the Group has developed the scope of tasks necessary to evaluate a Technical Impracticability Determination (“TI”) at the Site. Accordingly, the following sections provide a summary of Site conditions and the proposed framework of supplemental investigations and assessments that are needed for the development of a TI determination in accordance with the relevant USEPA regulatory guidance. This proposed scope of work supplements the work proposed in the Additional Groundwater Studies (AGWS) supplemental work plan (plan submitted separately) although some of the tasks relevant to the TI analysis have been incorporated into the AGWS field investigation program to the extent it is both efficient and practicable to do so.

As you are aware, the Group has retained Nigel Goulding of EHS Support, to work with Jim Peebles of Brown and Caldwell to address RD/RA issues at the Site. Mr. Goulding’s significant relevant expertise in Manufactured Gas Plants (MGPs) and his tenure in addressing both dense, non-aqueous phase liquids (DNAPL) and light, non-aqueous phase liquids (LNAPL) sources from MGP operations has provided a heightened level of experience to the Group’s ability to evaluate the Site data. Combined with Brown and Caldwell’s vast knowledge of current Site conditions, these experts have concluded that the MGP impacts within bedrock and the co-elution of chlorinated impacts within highly viscous and immobile DNAP and LNAPL sources from MGP operations makes this site an appropriate candidate for a TI determination. This letter summarizes their assessment and our plan for pursuing a TI waiver for groundwater at the CRS Site.



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Site Background:

The Site is approximately 2.5 acres in size, and is located in a predominantly industrial area of Elyria, Ohio. The western boundary of the Site runs along the East Branch of the Black River (River) with groundwater from the Site potentially discharging to this River.

In the late 19th century a Manufactured Gas Plant (MGP) operated at the Site. Following termination of the MGP operations a number of general industrial activities were conducted at the Site with chemical recovery and storage activities commencing at the Site in 1960. These activities continued at the Site until 1981 when CRS ceased all operations and removed distillation units, all tanks, drums, and all other spent solvent containers from the Site.

During this extensive period of operation, incidental releases and spillages have occurred, with MGP and solvent (chlorinated and non-chlorinated) impacts observed at the Site. Associated with the MGP operations releases of light and dense non-aqueous phase liquids (LNAPL and DNAPL) occurred at the facility. These low solubility, high viscosity and recalcitrant compounds have remained trapped within the bedrock for over 100 years. During operation of the solvent recycling business, releases of chlorinated and non-chlorinated solvents occurred. These solvents (and associated compounds) became mixed and co-eluted within the persistent MGP impacts. Chlorinated compounds have been detected in both the LNAPL and DNAPL at the Site.

Investigations conducted by Brown and Caldwell in 2011 determined that NAPL (both LNAPL and DNAPL) impacts are contained within a sandstone bedrock unit that underlies the Site. These impacts have been observed in both the inter-granular porosity of the rock and thin lateral fractures within the matrix of the rock and are therefore not readily accessible. Thus, these chlorinated constituents are present within these immobile and unrecoverable LNAPL/DNAPL.

Regulatory Framework:

The following documents provide guidance on the applicability criteria for TI:

- Guidance for Evaluating the Technical Impracticability of Groundwater Restoration – Interim Final. USEPA Directive 9234.2-25. September 1993. Office of Solid Waste and Emergency Response. U.S Environmental Protection Agency Washington DC.EPA/540-R-93-080
- Clarification of OSWER's 1995 Technical Impracticability Waiver Policy. OSWER Directive #9355.5-32. September 19, 2011.

These guidance documents clarify the process by which USEPA determines whether groundwater restoration is technically impractical and what alternative measures need to be undertaken to ensure that the final remedy is protective of human health and the environment. As part of these documents USEPA provides guidance on the technical data and analyses needed to support the decision process and the criteria used to make this determination.

The key data, analysis and criteria used in the evaluation can be divided into three main categories:

1. Hydrogeology – this includes the geologic and hydrogeologic conditions that pose limitations on the success of remediation with Site aspects including geologic complexity, heterogeneity, permeability (porous and non-porous), groundwater gradients and water table fluctuations

2. Contaminant Characteristics and Distribution – this includes contaminant phases present including LNAPLs and DNAPLs, the vertical and lateral distribution of impacts and distribution relative to primary and secondary porosity features, the physical and chemical properties of the contaminant of concerns and their amenability to biodegradation
3. Remedial Challenges, Limitations and Selection – Based on (1) and (2) above, this category includes a technical evaluation of remedial options and challenges and identifies alternative strategies that can be implemented to manage potential human health and environmental risks.

Technical Impracticability Assessment Objectives:

Accordingly, on the basis of Site conditions and the TI guidance, the following TI investigation project objectives have been defined:

1. Determine the feasibility of removing NAPL (both LNAPL and DNAPL) from bedrock at this Site.
2. Verify the immobility of DNAPL and LNAPL sources.
3. Assess and quantify the ongoing flux of constituents from DNAPL/LNAPL into groundwater
4. Quantify the nature and stability of groundwater impacts associated with NAPL at the Site.
5. Assess the potential human health and environmental risks associated with NAPL and dissolved phase impacts in the context of the Site hydro-geologic model.
6. Identify alternative remedial approaches for management of potential human health and environmental risks (if necessary).

Scope of Work

A program of supplemental groundwater assessment was proposed to USEPA to finalize AGWS. The work plan for this work was submitted to USEPA on February 6, 2012. The program of work will be conducted to further refine the understanding of the hydrogeologic framework in which NAPL and groundwater impacts are collocated. The program includes assessment of the hydrogeologic conductivity of zones within the bedrock unit, groundwater/surface water interactions and the temporal variability in groundwater elevations.

The conceptual hydrogeologic model developed from current and past work at the Site will provide the framework around which the future scope of work for these TI assessment activities will be developed upon finalization of the AGWS activities and USEPA agreement of the conceptual hydrogeologic model.

This TI will include fieldwork, modeling, and development of a NAPL and dissolved phase conceptual site model (CSM) as outlined in tasks 1 through 10 below. These tasks are designed to meet the assessment objectives described above.

In addition to the tasks described below, groundwater assessment activities will be conducted as part of supplemental investigation. These supplemental activities will be conducted to develop a conceptual

hydrogeologic model of the Site that will be used to assess the potential human health and environmental risks and potential alternative mitigation, management and remedial options.

This program of supplemental investigation activities will comprise the following main components of work:

1. Task 1 - Review of historical Site activities to identify sources areas of LNAPL and DNAPL impacts
2. Task 2 - Literature evaluation of NAPL properties
3. Task 3 - Assessment of LNAPL/DNAPL recovery rates
4. Task 4 -LNAPL chemical and physical property analysis
5. Task 5 -Rock core analysis and in-situ NAPL distribution, mobility, and recoverability evaluation
6. Task 6 - Assessment of water table fluctuations to evaluate the impact of water elevations on the mobility of NAPL, NAPL/groundwater interactions and the entrapment (residualization) of NAPL impacts over time.
7. Task 7 - River water sampling
8. Task 8 - NAPL modeling effort
9. Task 9 - Finalize conceptual hydrogeologic model
10. Task 10 - Complete focused feasibility study to evaluate remedial alternative

The fieldwork components of Tasks 3,4,5,6 and 7 have been integrated into the AGWS to expedite the field investigation program. In addition, the evaluation and assessment activities described below will be used to refine the hydrogeologic conceptual site model (CSM) developed in the AGWS. These revisions will include incorporation of elements that describe the distribution of LNAPL/DNAPL and dissolved phase impacts and the stability and attenuation of these impacts.

Task 1 – Review Historical Records

To better understand the genesis of impacts and potentially other MGP related source areas that may be located on-site, it is proposed that further historical reviews will be conducted for the Site. A review will be completed at the local historical library to determine if additional information is available regarding the MGP and Standard Oil operations at the Site. Also, the Electric Power Research Institute (EPRI) will also be contacted to determine if information is available on this Site. The file review will be completed to further refine our understanding of the location of historical MGP facilities and to correlate Site data with MGP operations. The historical operations and extent of current impacts will be used to support the assessment of LNAPL and DNAPL mobility and the comingling of chlorinated and MGP impacts.

Task 2 - Literature Evaluation of NAPL Properties

This evaluation will be used to assess the physical properties of MGP NAPL components in order to assess the potential mobility and recoverability of these constituents within bedrock. The combination of literature values and any physical testing data (if sufficient sample can be collected) will be used to further advance the concept that NAPL viscosity is a critical control on migration and recoverability at this Site.

Extensive studies have been conducted on the mobility and recoverability of NAPL (LNAPL and DNAPL) in bedrock and have demonstrated the limited mobility and recoverability of these materials. The viscosity and limited solubility of these NAPL sources are a critical limitation on the remediation of these impacts.

Task 3 – Assess and Quantify NAPL Recovery Rates and In-situ NAPL Transmissivities in Existing Wells

To date, limited accumulation and very low recovery rates for NAPL movement in monitoring wells have been observed at the Site. Consistent with the evolving NAPL conceptual site model, the highest NAPL saturations and greatest accumulation in wells are observed in wells closest to the former source area (coal tar pit and gasholders). The focus of this task is to provide additional lines of evidence and quantitative data to support these observations.

NAPL bail-down tests will be conducted to quantify recovery rates and on-site NAPL transmissivities. The NAPL bail-down tests will comprise the manual removal of NAPL from select wells (using bailers and absorbent socks) and measurement (over time) of NAPL re-accumulation (recharge) back into the well.

Task 4 – Characterization of the Chemical and Physical Properties of NAPL

To date a number of NAPL samples have been collected to assess the chemical and physical properties of NAPL at the site. During the process of bail-down testing (described in Task 3), samples of the NAPL will be collected for laboratory analysis of density, viscosity (at average groundwater temperatures), volatile organic content, and average molecular weight. Note that if insufficient NAPL volumes are present to support density and viscosity tests then samples will only be analyzed for chemical properties.

Information gained from these analyses will be used to further assess the low mobility and solubility of the constituents and quantify the potential mass flux of chlorinated and non-chlorinated species. Further discussion on the use of this analytical data is provided in the sections below.

Task 5 – Coring with Whole Core Analysis to Assess Contaminant Mass and Distribution

Plume longevity and the practicality of remediation are determined by the mass of contaminants trapped (inaccessible) within the bedrock. To facilitate better quantification of NAPL mass and to collect data critical for the American Petroleum Institute (API) – LNAPL Dissolution and Transport Screening Tool (LNAST) model described below, bedrock cores will be completed from within the NAPL area. These rock cores will be preserved (referred to hereafter as whole cores) and will be sent to a laboratory for chemical analysis (to quantify the NAPL mass present within bedrock) and petrophysical testing (LNAPL saturation tests and mobility testing). In addition (if sufficient NAPL is present) the chemical

analyses will be conducted to assess differences in the chemical properties of LNAPL and DNAPL sources and weathering.

In addition to quantification of the mass trapped within the bedrock, chemical analyses and petrophysical testing will be utilized to define the vertical distribution of contaminant mass through the vertical rock profile. NAPL mass trapped within the bedrock is inaccessible and unrecoverable and will be an important long-term source of impacts to groundwater. The vertical distribution of groundwater impacts is another important consideration in the LNAST modeling.

If sufficient NAPL (DNAPL or LNAPL) is present in the core, samples of NAPL will be extracted for chemical and petrophysical testing (consistent with that described in Task 3 above). This chemical and physical testing will be used to characterize the NAPL trapped within the rock matrix and can be contrasted with the properties of NAPL observed in wells.

Task 6 – Collect Information on Water Table Variations

Variations in the bedrock water table will tend to cause the residualization of NAPL (smearing) that will further limit the potential for the NAPL to migrate and be recovered. In addition, periods of high water table will tend to submerge NAPL with the presence of water within fractures providing an additional impediment to NAPL movement. Data from the transducer study being conducted as part of the supplemental groundwater investigation will be used to support the concept of a variable water table at the Site and the process of residualization of NAPL in the formation.

Task 7 – River Water Sampling

Surface water samples will be collected from the river to assess the potential mass flux of constituents from groundwater to surface water. The current conceptualization of groundwater conditions indicates that the impact from the migration and discharge of groundwater into surface-water is the primary source for mass transfers for the site. Samples will be collected upstream of the Site, at locations adjacent to the Site, and downstream of the Site in order to assess the potential mass fluxes and associated human health and environmental risks. This scope of work has been integrated into the AGWS.

Task 8 – NAPL Modeling

The LNAST model will be used with the input parameters derived from testing described above to assess the recoverability of LNAPL and DNAPL in the bedrock, NAPL (both LNAPL and DNAPL) and groundwater interactions and plume longevity under current conditions and following additional mass removal. The LNAST model will provide an additional line of evidence to evaluate if NAPL is immobile and unrecoverable, assess NAPL/groundwater interactions, quantify restoration timeframes, and assess the benefits of mass removal (if achievable) on restoration timeframes.

Task 9 – Finalize the Hydrogeologic CSM with our understanding of LNAPL/DNAPL conditions.

The Site hydrogeologic CSM, developed as part of the AGWS, will be further refined to include the NAPL/bedrock interactions, groundwater/NAPL interactions, groundwater bedrock flow system, and groundwater/river interactions. This CSM and the associated NAPL/groundwater interactions will be used to provide the framework for the assessment of alternative remedial options.

Task 10 – Focused Feasibility Study (FFS)

A FFS will be completed to evaluate potential remedial technologies for removing NAPL from the sandstone and restoring groundwater quality based on site conditions. It is expected that the FFS will incorporate information obtained from a review of EPRI information on remedial technologies and approaches implemented at other MGP sites (especially those with impacts in bedrock). The information obtained in the field tasks and modeling (outlined above) will be used to further evaluate viable technologies for removing NAPL from bedrock and reducing restoration timeframes.

If potentially complete exposure pathways are present, and viable methods for groundwater remediation are not determined feasible, remedial options including institutional controls may need to be evaluated and considered as supplemental or alternative remedial options.

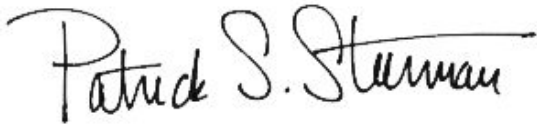
Closure:

As described above, this letter has been developed to provide an overview of the proposed scope of supplemental investigations designed to assess the applicability of Site conditions for a groundwater TI determination. This scope of work is in addition to the AGWS that is currently being proposed to refine the Site conceptual hydrogeological model. This CSM will be utilized to refine the scope of the TI investigation and assessment program as described above.

It is anticipated that a detailed scope of work for TI investigation and assessment activities will be developed upon completion (July 2012) of the AGWS. Once developed this TI Assessment work plan will be submitted to USEPA for approval prior to the commencement of the remaining work tasks (those not conducted as part of the AGWS).

If you have any questions regarding the rationale and scope of the proposed TI investigation and assessment activities please feel free to contact the undersigned at (770) 992-2836, or by electronic message to psteerman@charter.net.

Best Regards,



Patrick S. Steerman
CRS Site Project Coordinator

cc: Larry Antonelli, Ohio EPA
Nigel Goulding, EHS Support
Larry Mencin, CRS PRP Group, Technical Committee Chair,
Jim Peeples, Brown & Caldwell
Doug McWilliams, CRS PRP Group Counsel



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
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March 14, 2012

SR-6J

REPLY TO THE ATTENTION OF:

Mr. Patrick Steerman
Steerman Environmental Management & Consulting, LLC
422 Creek View Lane
Roswell, GA 30075

Re: Chemical Recovery Systems Inc. Site
Comments on Additional Groundwater Studies Supplemental Work Plan and Technical
Impacticability Determination Scope of Work

Dear Mr. Steerman:

On February 6, 2012, the U.S. Environmental Protection Agency (EPA) and Ohio Environmental Protection Agency (OEPA) received the additional groundwater studies supplemental work plan (AGWS-S) and Technical Impacticability Determination Scope of Work from Steerman Environmental Management & Consulting, representing the Chemical Recovery Systems Remedial Design/Remedial Action Group Performing Parties (Group). The additional work proposed for the site was discussed during the November 14, 2011 meeting between the Group and EPA. The need for additional investigation activities discussed in this meeting prompted the current supplement submitted by the Group to the March 2011 additional groundwater studies work plan (AGWS). This AGWS-S proposes activities to further evaluate the ground water, underlying bedrock, and non-aqueous phase liquids (NAPL) at the site. The Group intends to submit the results of these additional studies to the Agencies sometime in July 2012. The work will be completed to refine the hydrogeologic conceptual site model and to finalize the AGWS report.

Following are questions and comments from the Agencies on the plan. Mainly, we request clarifications.

1. Technical Impacticability Determination Scope of Work

For the three categories of data, analysis, and criteria used in evaluating the application of a technical impracticability (TI) waiver, item three (and task 10) seems to encompass an evaluation of the site's restoration potential, as described in EPA's TI guidance. Either here or in the proposed TI work plan, consider adding to the scope an outline of how the Group will evaluate whether other remedial technologies could feasibly attain cleanup levels in a reasonable timeframe. Also for task 10, consider adding an evaluation of costs for remedy options.

2. Standard Operating Procedures (SOPs), Calibration Procedures, and Quality Assurance/Quality Control (QA/QC) During Field Activities.

a. Field sampling SOPs detailing the ground water and surface water investigation activities were not included in the Supplemental Work Plan. The associated SOPs were not referenced and/or included in the AGWS-S to further support the field sampling procedures. SOPs should be referenced and/or included for all field readings and sample collections proposed in the work plan to further support the field sampling procedures.

b. A discussion is needed concerning the calibration procedures and standards to be used during field sampling. The AGWS-S lacks any discussion concerning the calibration standards that will be used during equipment calibration and during recovery and/or measurement activities.

c. Clarification is needed for those QA/QC procedures that will be employed during field sampling. The submittal did not discuss the collection of QA/QC samples during the various field sampling activities. Additional information should be provided which includes a discussion of the QA/QC procedures to be used.

d. Additional information is needed detailing the container preservation, shipping, and packaging procedures for the ground water samples, surface water samples, NAPL samples, and rock core samples. The submittal did not provide a discussion concerning container preservation, shipping, and packaging activities. The AGWS-S needs to briefly discuss or cite procedures for container preservation, shipping, and packaging.

e. A discussion on decontamination procedures is needed in the AGWS-S. The submittal lacks any discussion concerning field decontamination procedures.

The Agencies acknowledge that the SOPs and standards are contained within Attachment A (Field Sampling Plan) of the March 2011 AGWS Work Plan, and the original work plan was noted in the *References* of the AGWS-S. However, there does not appear to be any back reference of these procedures and protocols within the text of the AGWS-S. This could be stated within the *Introduction* of the 2012 Work Plan which does mention that the work described in the plan itself will supplement the information collected in the summer and fall of 2011.

3. Section 2.2 – Additional Clarification Needed Concerning the Temporal Level Measurement Activities.

a. Section 2.2 indicates that a “...*barometric transducer will be installed in the unsaturated zone of one of the wells...*” (pg. 2-1). The criteria that will be used to select this well were not discussed in the text. Inclusion of this well within the final report would be sufficient if its location is currently not known.

b. As with the comment above, Section 2.2 states that a stilling well will be installed “...*in the river at the location of the existing gauging rod...*” (pg. 2-1). The location of this stilling well should be illustrated in future report figures.

c. Section 2.2 indicates that "...data will be downloaded periodically during the collection period to minimize the potential for data loss ..." (pg. 2-1). It is unclear how frequently these data will be downloaded. Please state the frequency.

d. The last paragraph of this section states that a goal of the work is to determine if the river is, on average, a gaining stream. It should be recognized that a stream might be on average "gaining", yet have sections that locally are losing or might be on average "losing", yet have sections that locally are gaining.

4. Section 2.3 -- Observe Seep Zones

What is the anticipated accuracy of the "approximate measurements" proposed and at what frequency/how often will the measurements be made?

5. Section 2.4 -- Complete a Bathymetric Survey

How will the bathymetric survey facilitate identifying intervals of higher density of site bedrock fractures? What is the proposed resolution (i.e. the spacing), both horizontally and vertically of the bathymetric survey elevation measurements proposed?

6. Section 2.5 -- The procedure for rock permeability testing should be included within the final report.

a. The testing procedure proposed involves adding water to the aquifer. We generally do not recommend that water be added to the aquifer. There exist alternate approaches for testing the permeability of open rock sections of bedrock wells that do not require the addition of water. However, if water is to be added, the source of the "potable" water being used should be specified, the water should be tested (for volatile and semi-volatile organic compounds), and those results provided to the Agencies. Before wells to which water has been added are sampled again, the wells should be redeveloped to remove/reduce the effect of the added water.

b. While the work plan refers to ASTM D4630-96 as the testing method to be followed, a SOP specifically applicable to this project should be provided. This should include recording the total volume of water added to each well interval tested.

c. The work plan does not specify the depths of bedrock well segments to be tested or the lengths of the segments. Will this information be provided prior to initiating the testing?

7. Section 2.6 -- Surface Water Sampling

a. Will any screening be done to attempt to identify ground water discharge points? Samples should be collected from near the bottom of the water column (e.g. six inches above the river bottom).

b. The work plan proposes collecting the samples in collection bottles and then transferring the samples into the appropriate laboratory bottles/vials. While it is stated that care will be taken to minimize exposure to air and the disturbance of the water, the process of transferring will result in some volatilization. Samples should be collected in such a way that volatilization will not occur. This may be done, for example, by using the laboratory bottles/vials as the collection bottle (although preservation (if required) must be done after sample collection) or by collecting the samples using a pump with a short length of tubing.

c. It is stated that “The sampling procedures and chain-of-custody and shipping protocols will be completed according to the methods detailed in the Site Field Sampling Plan (FSP) (provided with the AGWS Work Plan)...”. There was no surface water sampling procedures provided in the June 2011 Additional Ground Water Studies Work Plan. Will a FSP Addendum be provided?

8. Section 3.1 – Information on NAPL Recovery and Measurement Activities.

a. Additional information is needed concerning which wells will be used for NAPL recovery activities. Section 3.1 indicates that “...*NAPL bail-down tests will be conducted to quantify recovery rates and onsite NAPL transmissivities.*” (pg. 3-1). However, the wells selected for this activity were not discussed in the submittal. If this information is not known yet, it can be documented in the final report.

b. In the second paragraph of this section, reference is made to the Field Sampling Plan (FSP). There was no dense NAPL sampling procedures provided in Appendix A: FSP of the June 2011 Additional Ground Water Studies Work Plan. Will a FSP Addendum be provided with SOPs for collecting NAPL directly and by using absorbent socks?

9. Section 3.2 – Bedrock Coring

a. Clarification is needed regarding petrophysical analysis. What properties will be measured (would the testing be limited to pore fluid saturation of NAPLs)? Will a SOP be provided for this testing?

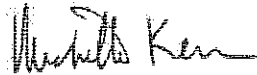
b. Reference is made in the second paragraph to “the required depth”. What is the required depth of the rock coring? If coring goes deeper than the first impacted interval, how will pull-down be prevented?

c. The third paragraph mentions that cores will be preserved. What exactly does this mean? Perhaps the applicable SOP may explain this.

d. For chemical analysis of the rock core samples, will the rock be crushed prior to analysis (e.g. in the lab)?

Thank you for your attention to these questions and comments. If you choose to, we can set up a call to talk about the work plan and comments soon. If you have any questions or concerns, please contact me at (312) 886-8961.

Sincerely,

A handwritten signature in black ink, appearing to read "Michelle Kerr". The signature is fluid and cursive, with the first name "Michelle" written in a larger, more prominent script than the last name "Kerr".

Michelle Kerr
Remedial Project Manager

cc via email: L. Antonelli, OEPA
L. Mencin, Sherwin Williams
J. Peeples, B&C
L. Vanderpool, EPA



via first class mail

April 5, 2012

Michelle Kerr
Remedial Project Manager
U.S EPA – Region 5
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Mail Code: S-6J
Chicago, IL 60604-3590

**Re: Response to USEPA Comments Regarding Additional Groundwater Studies Supplemental Work Plan and Technical Impracticability Determination Scope of Work
United States of America v. AK Steel Corporation et. al.
Case No. 1:10-cv-00996-KMO
Chemical Recovery Systems Site, Elyria, Ohio**

Dear Ms. Kerr:

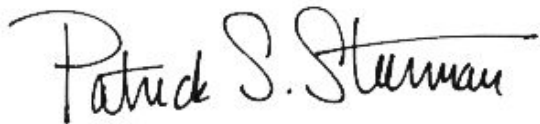
On February 6, 2012, the Chemical Recovery Systems, Inc. (CRS) Site Remedial Design/Remedial Action (RD/RA) Group Settling Performing Defendants (Group) submitted an Additional Groundwater Studies Supplemental (AGWS-S) Work Plan and, under separate cover, a letter discussing a Technical Impracticability (TI) Determination Scope of Work for the CRS site (the Site). The additional work proposed for the Site was discussed during the November 14, 2011 meeting between the Group and the United States Environmental Protection Agency (USEPA). The need for additional investigation activities discussed in this meeting prompted the February 6, 2012 supplement to the approved March 2011 Additional Groundwater Studies Work Plan (AGWS). In a letter dated March 14, 2012, the USEPA provided questions and comments on the AGWS-S Work Plan and the TI Determination Scope of Work. The questions and comments were reviewed by the Group and are addressed in the enclosed letter prepared by Brown and Caldwell. In this letter, the questions and comments are listed and are followed by responses by the Group shown in italics. As referenced in the letter, a revised AGWS-S work plan, which includes a copy of the revised Field Sampling Plan and Quality Assurance Project Plan, is enclosed for your review.

If you have any questions regarding the rationale and scope of the proposed TI investigation and assessment activities please feel free to contact the undersigned at (770) 992-2836, or by electronic message to psteerman@charter.net.



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422 Creek View Lane
Roswell, Georgia 30075
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psteerman@charter.net

Best Regards,

A handwritten signature in black ink that reads "Patrick S. Steerman". The signature is written in a cursive style with a long horizontal line extending from the end of the name.

Patrick S. Steerman
CRS Site Project Coordinator

cc: Larry Antonelli, Ohio EPA
Nigel Goulding, EHS Support
Larry Mencin, CRS PRP Group, Technical Committee Chair,
Jim Peeples, Brown & Caldwell
Doug McWilliams, CRS PRP Group Counsel



April 5, 2012

Patrick S. Steerman
Steerman Environmental Management & Consulting, LLC
422 Creek View Lane
Roswell, Georgia 30075

139452

Subject: Response to USEPA Comments regarding the Additional Groundwater Studies Supplemental Work Plan and Technical Impracticability Determination Scope of Work
United States of America v. AK Steel Corporation et. al.
Case No. 1:10-cv-00996-KMO
Chemical Recovery Systems Site, Elyria, Ohio

Dear Mr. Steerman:

On February 6, 2012, the Chemical Recovery Systems, Inc. (CRS) Site Remedial Design/Remedial Action (RD/RA) Group Settling Performing Defendants (Group) submitted an Additional Groundwater Studies Supplemental (AGWS-S) Work Plan and, under separate cover, a letter discussing a Technical Impracticability (TI) Determination Scope of Work for the CRS site (the Site). The additional work proposed for the Site was discussed during the November 14, 2011 meeting between the Group and the United States Environmental Protection Agency (USEPA). The need for additional investigation activities discussed in this meeting prompted the February 6, 2012 supplement to the approved March 2011 Additional Groundwater Studies Work Plan (AGWS). The AGWS-S proposes activities to further evaluate the ground water, underlying bedrock, and non-aqueous phase liquids (NAPL) at the Site; to refine the hydrogeologic conceptual site model; and to finalize the AGWS report. As discussed in the AGWS-S, proposed field activities include the collection of Site field data proposed in the TI Determination Scope of Work. In a letter dated March 14, 2012, the USEPA provided questions and comments on the AGWS-S Work Plan and the TI Determination Scope of Work. The questions and comments are provided below and are followed by responses by the Group shown in italics.

1. Technical Impracticability Determination Scope of Work

For the three categories of data, analysis, and criteria used in evaluating the application of a technical impracticability (TI) waiver, item three (and task 10) seems to encompass an evaluation of the site's restoration potential, as described in EPA's TI guidance. Either here or in the proposed TI work plan, consider adding to the scope an outline of how the Group will evaluate whether other remedial technologies could feasibly attain cleanup levels in a reasonable timeframe. Also for task 10, consider adding an evaluation of costs for remedy options.

Group Response:

In accordance with the TI framework, the Group proposes to develop a focused feasibility study that assesses any other remedial technologies demonstrated capable of achieving the current cleanup levels within a reasonable timeframe. This focused feasibility study will be supported by:

1. *A literature review of remedial activities and demonstrated successes at other Manufactured Gas Plant sites where LNAPL and DNAPL are present within bedrock; and*
2. *Fate and transport modeling to assess the benefits of source remediation on plume extent and longevity (key considerations under the criteria outlined in the NCP).*

As part of the focused feasibility study, the Group will evaluate the costs of the technically feasible remedial options in the context of the net environmental benefits (if any) of each remedial alternative.

2. Standard Operating Procedures (SOPs), Calibration Procedures, and Quality Assurance/ Quality Control (QA/QC) During Field Activities.

- a. Field sampling SOPs detailing the ground water and surface water investigation activities were not included in the Supplemental Work Plan. The associated SOPs were not referenced and/or included in the AGWS-S to further support the field sampling procedures.

SOPs should be referenced and/or included for all field readings and sample collections proposed in the work plan to further support the field sampling procedures.

Group Response:

References have been added to the AGWS-S to indicate the location of relevant Standard Operating Procedures (SOPs) and work descriptions that are contained in the approved March 2011 Field Sampling Plan (FSP). A description of the surface water sampling methods has been added to the FSP and is referenced in the AGWS-S. Additional references have been added to the AGWS-S to indicate locations within the FSP where specific and detailed procedures for obtaining field readings and completing field sampling can be found. The revised FSP and AGWP-S are transmitted with this letter.

- b. A discussion is needed concerning the calibration procedures and standards to be used during field sampling. The AGWS-S lacks any discussion concerning the calibration standards that will be used during equipment calibration and during recovery and/or measurement activities.

Group Response:

Descriptions of calibration procedures and standards for work to be completed in the AGWS-S are provided in the approved FSP and Quality Assurance Project Plan (QAPP). References to the relevant sections of the FSP and QAPP have been added to the revised AGWS-S.

- c. Clarification is needed for those QA/QC procedures that will be employed during field sampling. The submittal did not discuss the collection of QA/QC samples during the various field sampling activities. Additional information should be provided which includes a discussion of the QA/QC procedures to be used.

Group Response:

Sampling Quality Assurance/Quality Control (QA/QC) procedures are detailed in the September 2010 approved QAPP and in the FSP. The procedures indicate the number and type of QA/QC samples that will be collected for the field activities performed for the AGWS-S. References to relevant sections of the QAPP and FSP have been added to the revised AGWS-S Work Plan.

- d. Additional information is needed detailing the container preservation, shipping, and packaging procedures for the ground water samples, surface water samples, NAPL samples, and rock core samples. The submittal did not provide a discussion concerning container preservation, shipping, and packaging activities. The AGWS-S needs to briefly discuss or cite procedures for container preservation, shipping, and packaging.

Group Response:

Procedures for groundwater, surface water, and NAPL sample container preservation, packaging and shipping for all sample matrices are contained in the updated FSP, attached to the revised AGWS-S Work Plan. References to the FSP have been inserted at the appropriate locations within the AGWS-S Work Plan. With respect to rock core collection, handling and preservation will be conducted in accordance with API Recommended Practice 40 (RP 40) which is the industry standard for collection of NAPL and core samples for petrophysical testing. These methods have been developed for the oil industry for non-aqueous phase fluids and are recognized as the industry standards by which samples should be collected, handled, preserved and shipped to the laboratory. API RP 40 and the PTS laboratories recommendations for shipment have been added to the FSP. Once received at the laboratory the samples will be kept frozen at cryogenic temperatures to ensure that the pore fluids are retained within the core prior to core photography and/or analysis.

- e. A discussion on decontamination procedures is needed in the AGWS-S. The submittal lacks any discussion concerning field decontamination procedures.

Group Response:

Decontamination procedures are discussed in the FSP and references to the FSP have been added to the AGWS-S regarding decontamination procedures.

The Agencies acknowledge that the SOPs and standards are contained within Attachment A (Field Sampling Plan) of the March 2011 AGWS Work Plan, and the original work plan was noted in the *References* of the AGWS-S. However, there does not appear to be any back reference of these procedures and protocols within the text of the AGWS-S. This could be stated within the *Introduction* of the 2012 Work Plan which does mention that the work described in the plan itself will supplement the information collected in the summer and fall of 2011.

Group Response:

The suggested references to the FSP and QAPP have been added to the introduction of the AGWS-S, and references to the FSP and QAPP also

have been added in several locations within relevant task descriptions. An updated version of the FSP is now included as an appendix to the AGWS-S.

3. Section 2.2 - Additional Clarification Needed Concerning the Temporal Level Measurement Activities.

- a. Section 2.2 indicates that a "...barometric transducer will be installed in the unsaturated zone of one of the wells..." (pg. 2-1). The criteria that will be used to select this well were not discussed in the text. Inclusion of this well within the final report would be sufficient if its location is currently not known.

Group Response:

The reason for placing the barometric probe inside a well casing is to minimize the temperature fluctuations that the probe is exposed to and improve barometric pressure data quality. To achieve this, the barometric transducer/data logger (probe) can be added to the unsaturated portion of any monitoring well at the site. The text of the AGWS-S has been updated to indicate this. The final selection of a well for placement of the barometric probe will be made at the time of the field investigation.

- b. As with the comment above, Section 2.2 states that a stilling well will be installed "...in the river at the location of the existing gauging rod..." (pg. 2-1). The location of this stilling well should be illustrated in future report figures.

Group Response:

The location of the stilling well and the river gauge will be illustrated in future report figures.

- c. Section 2.2 indicates that "...data will be downloaded periodically during the collection period to minimize the potential for data loss..." (pg. 2-1). It is unclear how frequently these data will be downloaded. Please state the frequency.

Group Response:

The maximum time between data downloads for the transducers will be three weeks. A statement indicating this has been added to the AGWS-S.

- d. The last paragraph of this section states that a goal of the work is to determine if the river is, on average, a gaining stream. It should be recognized that a stream might be on average "gaining", yet have sections that locally are losing or might be on average "losing", yet have sections that locally are gaining.

Group Response:

It is recognized that the river will likely be a gaining stream in some locations and a losing stream in other locations. The intent of the work described in the AGWS-S Work Plan will be to evaluate the segment of the river along the boundary of the Site. It is very likely that conditions along this small stretch of river will be consistent and can be characterized as being, on average, gaining or losing. The intent of the work described in

the AGWS-S will be to collect and evaluate data necessary to make this determination for just the stretch of the river along the Site boundary.

4. Section 2.3 - Observe Seep Zones

What is the anticipated accuracy of the "approximate measurements" proposed and at what frequency/how often will the measurements be made?

Group Response:

It is recognized that there are limitations with the quantification of flows using the methodologies proposed in the AGWS-S Work Plan. However, the purpose of the assessment of the rock phase is to provide a weight of evidence approach to the assessment of hydraulic conductivities and groundwater flux. The seep face assessment will be supported by hydraulic conductivity testing conducted on-site which will be used to develop Darcian estimates of groundwater flux. In all cases the seeps will be marked, mapped and the dimensions measured and information recorded in the field notes. In addition, photographs of the observed seeps (if present) will be provided.

The accuracy of the measurements made will depend on the ability to account for all the flow from a given seep. It should be understood that, to date, the seeps have been observed as wet spots with minimal to no observable water flow or dripping. If no water flow is observed at a given seep, we will quantify the maximum rate of flow as the rate of evaporation from the wet rock surface, given the environmental conditions at the time of the observation. If observable flow is present it will be directed, as much as is reasonably possible, to a central location where it will be quantified based on the rate of filling a known container volume. Under the appropriate circumstances, these measurements can be quite accurate. If accurate flow rate measurements cannot be obtained at a given location, this result will be documented.

The intent of this work is to obtain seep flow measurements from all active seeps on a single day, and that only one set of seep flow measurements will be obtained. These estimates of seep flows will be compared and contrasted to the Darcian mass fluxes in order to estimate (for the purposes of the hydrogeologic conceptual site model) the potential bank and basal discharge of groundwater to the river. It is anticipated that collectively, seeps from the Site only contribute a very small component of the groundwater flow to the river.

5. Section 2.4 - Complete a Bathymetric Survey

How will the bathymetric survey facilitate identifying intervals of higher density of site bedrock fractures? What is the proposed resolution (i.e. the spacing), both horizontally and vertically of the bathymetric survey elevation measurements proposed?

Group Response:

The river bed topography will be characterized using a grid of survey points placed approximately 10-feet on center through the study area (from the east river bank to the west bank and at least to the north and south boundaries of the Site). For each survey point, an observation will be made regarding the presence of a hard bottom, gravel/rubble, or a soft bottom, indicating the nature of the river base material at each location. This determination will be made with a survey rod that has a "shoe" (to prevent it from sinking into the alluvial soil) to

define the presence and upper elevation of alluvial materials and a survey rod with a point (advanced to refusal) to define the upper surface of the bedrock. This will allow for measurement of the rock and alluvial surfaces and the thickness of alluvial materials, where present, through the study area.

The bathymetric survey will not provide information regarding intervals of higher fracture density in the bedrock. The AGWS-S Work Plan indicates that the base of the river (accurately depicted with the bathymetric survey) will be included in cross sections that will show the Site topographic features (such as the base of the river) in comparison to high fracture density portions of the bedrock identified within the Site. The fracture density of the bedrock will be determined from the boring logs and geophysical logging conducted onsite as part of the completed AGWS and the proposed AGWS-S. The elevation and orientation of these identified fractures will be projected from the site towards the river to assess if they are potentially intercepted. The fractures evident on the bedrock outcrop in the southwest area of the Site will be surveyed and also noted in the cross sections.

6. Section 2.5 - The procedure for rock permeability testing should be included within the final report.

- a. The testing procedure proposed involves adding water to the aquifer. We generally do not recommend that water be added to the aquifer. There exist alternate approaches for testing the permeability of open rock sections of bedrock wells that do not require the addition of water. However, if water is to be added, the source of the "potable" water being used should be specified, the water should be tested (for volatile and semi-volatile organic compounds), and those results provided to the Agencies. Before wells to which water has been added are sampled again, the wells should be redeveloped to remove/reduce the effect of the added water.

Group Response:

It is agreed that water reasonably free of VOCs and SVOCs should be used for the bedrock testing. To accomplish this, only locally available potable water (i.e., City of Elyria drinking water) will be added to the aquifer as part of permeability testing. The source of this water will be documented in the final AGWS report. To the extent necessary, test data regarding VOCs/SVOCs can be obtained from the potable water supplier.

While there are methods for testing bedrock permeability that involve the withdrawal of water from the boring, rather than the addition of water, it is believed that injection methods are better suited for this specific application. The purpose of permeability testing is to measure bedrock permeability in areas of the borehole that are isolated by a packer system. Because of the packer placement and the size of the bore hole, a pump cannot be installed within the packer system for water withdrawal. We recognize that methods are available for water extraction under vacuum from the surface, but these approaches would limit the scope and accuracy of what can be accomplished. The proposed injection procedure is believed to provide greater flexibility, and generally better accu-

racy for this testing, particularly in bedrock zones with lower permeability.

Because the injection procedure will be conducted over a relatively short time period, the amount of potable water injected into the formation is expected to be small. However, the total volume of potable water injected into each well tested will be recorded, and if a tested well is sampled for chemical analysis in the future, a similar volume of water will be purged from the well prior to initiating the standard well sampling procedure, Section 2.5 of the AGWS-S Work Plan was revised to include this statement.

- b. While the work plan refers to ASTM D4630-96 as the testing method to be followed, a SOP specifically applicable to this project should be provided. This should include recording the total volume of water added to each well interval tested.

Group Response:

A field procedure, based on the ASTM method has been added to the FSP. The procedure includes recording of the volume of water added at each interval and the total water added at any given well.

- c. The work plan does not specify the depths of bedrock well segments to be tested or the lengths of the segments. Will this information be provided prior to initiating the testing?

Group Response:

The intent of this work will be to test all open rock zones in each of the wells listed in the AGWS-S for testing. However, it may not be feasible to test some intervals based on field observations of the configuration of the open rock segment, casing, etc. The actual dimensions of the bedrock segments tested will be included in the final report.

7. Section 2.6 - Surface Water Sampling

- a. Will any screening be done to attempt to identify ground water discharge points? Samples should be collected from near the bottom of the water column (e.g. six inches above the river bottom).

Group Response:

The use of temperature and conductivity profiles vertically and laterally along the edge of the river was considered as a possible methodology for identifying groundwater discharge zones. However, the conductivity and temperatures of groundwater are considered too similar to surface water and the flux of groundwater too low to make this a viable methodology for the CRS Site. On this basis, the collection of multiple grab samples, focusing on areas where groundwater equipotentials indicate potential preferential discharge areas and where groundwater concentrations are highest, is considered the most viable methodology, and this is what has been proposed.

As indicated in this comment, the water samples will be collected near the river bed (approximately six-inches above the river bed). The re-

quired depth at any given location will be determined based on the bathymetric survey and will be recorded with each sample. A more detailed description of the surface water sampling has been added to the FSP.

- b. The work plan proposes collecting the samples in collection bottles and then transferring the samples into the appropriate laboratory bottles/vials. While it is stated that care will be taken to minimize exposure to air and the disturbance of the water, the process of transferring will result in some volatilization. Samples should be collected in such a way that volatilization will not occur. This may be done, for example, by using the laboratory bottles/vials as the collection bottle (although preservation (if required) must be done after sample collection) or by collecting the samples using a pump with a short length of tubing.

Group Response:

Based on this comment, surface water sampling will be completed with the actual containers that will be used to ship the samples to the laboratory. For VOC samples, the container will be preserved after the sample is collected.

- c. It is stated that "*The sampling procedures and chain-of-custody and shipping protocols will be completed according to the methods detailed in the Site Field Sampling Plan (FSP) (provided with the AGWS Work Plan)...*". There was no surface water sampling procedures provided in the June 2011 Additional Ground Water Studies Work Plan. Will a FSP Addendum be provided?

Group Response:

A section has been added to the FSP (attached) that addresses surface water sampling.

8. Section 3.1 - Information on NAPL Recovery and Measurement Activities.

- a. Additional information is needed concerning which wells will be used for NAPL recovery activities. Section 3.1 indicates that "*...NAPL bail-down tests will be conducted to quantify recovery rates and onsite NAPL transmissivities.*" (pg. 3-1). However, the wells selected for this activity were not discussed in the submittal. If this information is not known yet, it can be documented in the final report.

Group Response:

Wells MW-6, MW-7A, MW-13A, and MW-14A will be tested. These wells were selected because they contained NAPL following installation and it is assumed that NAPL has re-accumulated since the wells were last sampled. If one or more of these wells no longer contains a measurable quantity of NAPL, testing will not be performed on the well. The wells selected for NAPL recovery will be documented in the final report.

- b. In the second paragraph of this section, reference is made to the Field Sampling Plan (FSP). There was no dense NAPL sampling procedures provided in Appendix A: FSP of the June 2011 Additional Ground Water Studies Work Plan. Will a

FSP Addendum be provided with SOPs for collecting NAPL directly and by using absorbent socks?

Group Response:

NAPL sampling procedures have been addressed in previous correspondence for this project (at the time that NAPL sampling was completed in MW-6). The procedures followed previously have been expanded and are now included in the FSP (attached to this AGWS-S Work Plan).

9. Section 3.2 - Bedrock Coring

- a. Clarification is needed regarding petrophysical analysis. What properties will be measured (would the testing be limited to pore fluid saturation of NAPLs)? Will a SOP be provided for this testing?

Group Response:

A range of petrophysical parameters will be included in the proposed testing program. These parameters will be defined somewhat by field observations and the fluid saturations observed in the core. The initial petrophysical testing will focus on defining pore fluid saturations, the physical properties of the rock matrix (grain density, porosity, conductivity and intrinsic permeability) and if sufficient fluids are extractable from the core to determine the chemical properties and physical properties of the NAPL. All of the initial testing of the cores will be conducted in accordance with standard methodologies as outlined by ASTM or the API. These initial tests will comprise the following:

- Grain Density (API RP40)*
- Total Porosity (API RP40)*
- Air-Filled Porosity (API RP40)*
- Effective Porosity (Mod. ASTM D425)*
- Pore Fluid Saturations (API RP40)*
- Hydraulic Conductivity (API RP40/EPA 9100)*
- Intrinsic Permeability (API RP40)*
- Specific Gravity of Fluids (ASTM D854) or Fluid Density (ASTM D1481)*
- Viscosity of Fluids (ASTM D445)*

To define the residual saturation (the lowest NAPL saturation achievable through mechanical means) of the rock cores a series of test methods will be employed based on the findings of the initial petrophysical tests. These tests will be conducted similarly in accordance with ASTM and API methodologies used extensively in the petroleum industry. The methods will comprise:

- Residual Saturation by Direct Centrifuge Method (API RP 40) – this methodology is a centrifuge method (refer to attached API RP40 document) which applies 1000 time gravity for one hour to assess product mobility. The method provides initial and residual pore fluid saturations, total porosity, dry bulk density and grain density measurements. This methodology is an air displacing oil (nonaqueous flu-*

id) methodology and applies high stresses and forces that cannot be replicated under field conditions. On this basis the method is considered highly conservative for assessing the amounts of fluids that could be potentially removed from the core. This method is utilized extensively as a screening methodology based on the ease of testing and low cost.

- Residual Saturation by LNAPL/Water Imbibition Capillary Pressure Package (API RP40 and ASTM6836) – this also is a centrifuge method but involves the water displacing oil rather than air. The methodology uses a lower range of capillary pressures (typically up to 5 psi) that better reflect the stresses that can be induced by remedial processes. The method is more involved and expensive and is typically used to assess NAPL mobility at and below the water table (where NAPL is displaced by water). The analytical method provides measures of initial and residual fluid saturations, NAPL production versus capillary pressure, total porosity, dry bulk density, specific permeability to LNAPL and hydraulic conductivity.*

This list of petrophysical parameters and a copy of API RP40 has been added to the FSP to detail the standard methodologies to be employed in these analyses. Additional detail on the petrophysical testing has also been added to the AGWS-S in response to this comment.

- b. Reference is made in the second paragraph to "the required depth". What is the required depth of the rock coring? If coring goes deeper than the first impacted interval, how will pull-down be prevented?

Group Response:

The boring and rock coring methods described in the AGWS Work Plan will be followed during implementation of the AGWS-S work, with the exception that wells will not be installed. References have been added to the AGWS-S to indicate this. The intent of this boring program will be to collect whole rock cores from the first interval where NAPL is encountered. This will limit the chance that NAPL will be dragged to a greater depth. The borings will also be grouted upon completion, so there will be little opportunity for NAPL to travel to greater depths in the boring. If insufficient whole core material is obtained from the first interval where NAPL is encountered, additional coring will occur only to the depth necessary to collect the quantity of whole rock core material needed for laboratory testing.

- c. The third paragraph mentions that cores will be preserved. What exactly does this mean? Perhaps the applicable SOP may explain this.

Group Response:

The core sampling, preservation and sampling will be conducted in accordance with API RP 40 which has been discussed in detail in the response above and has been added to the FSP.

- d. For chemical analysis of the rock core samples, will the rock be crushed prior to analysis (e.g. in the lab)?

Group Response:

Chemical analysis of the rock cores will be conducted to characterize the chemical composition of both mobile and residual NAPL within the rock matrix. These data are critical for determining the dissolution of NAPL into groundwater, the likely fate and transport of NAPL in groundwater and the longevity of the plume.

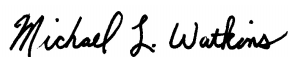
Subsamples of the cryogenically frozen core will be sent to a chemical testing laboratory, preserved and crushed in the laboratory for chemical extraction and tested in accordance with standard analytical methodologies for VOCs, SVOC's, Volatile Petroleum Hydrocarbons (VPH) and Extractable Petroleum Hydrocarbons (EPH). To assess the potential solubility and mobility of VOC and SVOC compounds contained within the NAPL, the effective solubility of these compounds will be calculated using Raoult's Law. The VPH and EPH methodologies and associated carbon chain length concentrations will be used to estimate the average molecular weight of the NAPL and then the mole fraction of VOCs and SVOC's within the NAPL solution.

Both the mass fractions and effective solubility are critical input parameters in the proposed screening level groundwater model that will be included as part of the data assessment and focused feasibility study.

Please contact me at 216-606-1309 if you have any questions regarding the responses provided above or the changes/additions made to the attached AGWS-S.

Sincerely,

Brown and Caldwell



Michael Watkins, P.G.
Project Manager

cc via email: J. Peeples, BC

Attachment:

Additional Groundwater Studies Supplemental Work Plan (Revision 1 - April 2012)



via overnight mail and electronically

December 17, 2012

Michelle Kerr
Remedial Project Manager
U.S EPA – Region 5
77 W. Jackson Blvd.
Mail Code: S-6J
Chicago, IL 60604-3590

**Re: CRS Site Draft Technical Impracticability Assessment
United States of America v. AK Steel Corporation et. al.
Case No. 1:10-cv-00996-KMO
Chemical Recovery Systems Site, Elyria, Ohio**

Dear Ms. Kerr:

Enclosed is a draft Technical Impracticability Assessment for the Chemical Recovery Systems, Inc. ("CRS") Site. This assessment was prepared by EHS Support Services and is submitted on behalf of the CRS Site Remedial Design/Remedial Action ("RD/RA") Group Settling Performing Defendants. If you have any questions or comments, please feel free to contact the undersigned at (770) 992-2836, or by electronic message to psteerman@charter.net.

Best Regards,

Patrick S. Steerman
CRS Site Project Coordinator

ec: Larry Antonelli, Ohio EPA (electronic copy)
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